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Elevated symptom prevalence associated with ventilation type in office buildings.

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The California Healthy Building Study was designed to assess relations between ventilation system type and office worker symptoms in a set of U.S. buildings selected without regard to worker complaints. Twelve public office buildings in northern California meeting specific eligibility criteria were studied in the summer of 1990: three naturally ventilated, three mechanically ventilated (without air conditioning), and six air-conditioned buildings. Questionnaire data were collected from 880 workers in selected spaces within the study buildings. We adjusted effect estimates for various ventilation types for personal, job, and work place factors using logistic regression, and alternatively, using a mixed effects model (SAS/GLIMMIX) to adjust for correlated responses within study spaces. Higher adjusted prevalences of most symptom outcomes were associated with both mechanical and air-conditioned ventilation, relative to natural. With a conservative adjustment for problem building status, the highest adjusted prevalence odds ratios from logistic regression models were for dry or itchy skin [mechanical: odds ratio (OR) = 6.0, 95% confidence interval (CI) = 1.6-22; air-conditioned: OR = 6.0, 95% CI = 1.7-21] and lower respiratory symptoms (mechanical: OR = 2.9, 95% CI = 0.7-11; air-conditioned: OR = 4.0, 95% CI = 1.1-15). GLIMMIX estimates were similar, with slightly wider confidence intervals. Reporting bias was small. These findings of symptom increases within mechanically ventilated and air-conditioned U.S. buildings support previous findings available only from European buildings.

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